


## RESEARCH ARTICLE

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# Proceedings of resources for optimal care of acute care and emergency surgery consensus summit Donegal Ireland

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## Abstract

**Background:** Opportunities to improve emergency surgery outcomes exist through guided better practice and reduced variability. Few attempts have been made to define optimal care in emergency surgery, and few clinically derived key performance indicators (KPIs) have been published. A summit was therefore convened to look at resources for optimal care of emergency surgery. The aim of the Donegal Summit was to set a platform in place to develop guidelines and KPIs in emergency surgery.

**Methods:** The project had multidisciplinary global involvement in producing consensus statements regarding emergency surgery care in key areas, and to assess feasibility of producing KPIs that could be used to monitor process and outcome of care in the future.

**Results:** Forty-four key opinion leaders in emergency surgery, across 7 disciplines from 17 countries, composed evidence-based position papers on 14 key areas of emergency surgery and 112 KPIs in 20 acute conditions or emergency systems.

**Conclusions:** The summit was successful in achieving position papers and KPIs in emergency surgery. While position papers were limited by non-graded evidence and non-validated KPIs, the process set a foundation for the future advancement of emergency surgery.

**Keywords:** Emergency surgery, Optimal care, Performance indicators, Surgical outcomes

## Background

Optimal consistent emergency surgery care presents a major health challenge worldwide [1–3]. Patients requiring urgent surgical care are often critically ill with significant pre-existing comorbidities [4]. While there is a wide spectrum of potential presenting surgical conditions, there is a predictable pattern because the top seven emergency surgery conditions account for nearly 80% of presentations [5]. Modern surgical care requires

a multi-disciplinary approach and streamlined acute pathways are critical to ensure optimal outcomes [6].

Historically, it is not uncommon to manage emergency surgical patients interspersed with daily elective activities within a given hospital system [7]. The lack of timely appropriate access to emergency surgical care is often multi-factorial and may include shortage of emergency surgeons, inadequate access to the operating room, lack of a dedicated team, and a paucity of clinical pathways [8].

Over the past decade, the importance of a comprehensive system in managing emergency surgical care has become evident, resulting in training bodies and health

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ministries publishing multiple consensus papers and statements on this topic [6, 9–13].

Monitoring emergency surgery performance and outcomes is essential and clinicians themselves need to be involved in determining key performance indicators (KPIs). KPIs in emergency surgery have not been widely developed. For this reason, under the leadership of the World Society of Emergency Surgery, with support from the Abdominal Compartment Society and Donegal Clinical Research Academy key opinion leaders in the field of emergency surgery care across many disciplines were invited to contribute to a Performance Summit in Donegal in 2016.

The Emergency Surgery Performance Summit aimed to develop key performance indicators in clinical and systems delivery that would lay the foundation for future optimal surgery development.

## Methods

Common aspects of emergency surgery were identified into 14 categories (Table 1), 44 key opinion leaders were invited to participate and co-author individual chapters. There were 14 position papers and 20 topics for KPI development (Table 2). A review of published articles and consensus statements relating to the establishment and design of emergency, acute care surgery, and emergency general services was performed. Emergency surgery position statements from the surgical colleges, surgical institutions and key government organisations were assessed. The key performance indicators were proposed according to a standardised pro forma (Table 3). Each KPI had to be easily measured and reproducible. Due to the extent and complexity of topics and number of authors, the original intent to grade level was not uniform and thus reporting was confined to consensus opinion.

**Table 1** Key position topics for summit

Resources and designation of emergency surgery
Acute care unit structure
Reception and triage
Data systems, registry and evaluation
Rural emergency care and transfer
Paediatric emergency care
Geriatric emergency care
Interaction and laboratory, radiology, ICU gastroenterology
Quality assurance and performance improvement
Sepsis control in emergency room
Research in acute care surgery
Education in emergency surgery
Accreditation review and consultative program
Patient related outcomes measures

**Table 2** Key performance indicators topics

Appendicitis
Cholecystitis
Pancreatitis
Perforated ulcer
Gastrointestinal bleeding
Bowel obstruction
Diverticulitis
Mesenteric ischaemia
Abdominal vascular emergencies
Coagulation
Complex pneumothorax and empyema
Septic shock in emergency; ICU
Fluid resuscitation in septic shock
Abdominal compartment syndrome
Geriatric care
Triage; ICU admission
Laboratory
Wound care
Emergency theatre
Health care systems

## Results

The summit was held in Lough Eske Castle Donegal Ireland on 25 July 2016, attended by 80 people of which 44 contributed to writing the Proceeding's chapters, and associated KPIs. The key opinion leaders were from seven disciplines, predominantly surgery, but also including critical care, internal medicine, emergency medicine, radiology and nursing. There were 119 KPIs

**Table 3** Example of KPI of 1 of the 112 KPI generated

Title	Negative appendectomy rate
Description	Percentage of negative appendectomies performed
Rationale	It is an indicator of diagnostic efficiency. In order to avoid unnecessary surgery and decrease costs and complications.
Target	< 10% appendixes removed are normal
KPI collection frequency	Annually
KPI reporting frequency	Annually
KPI calculation	Numerator divided by denominator expressed as a percentage Numerator: number of patients underwent appendectomy with negative appendectomy Denominator: number of all patients underwent appendectomy
Reporting aggregation	Hospital, hospital group
Data source(s)	OR registry, medical records, patients chart, hospital discharge data, emergency surgery database

described for the 20 conditions, a sample is shown in Table 3. The entire proceedings for the summit are available on line [14]. The summit provided a platform for discussion and agreed consensus on the key position topics. Future resources for advancing systems, clinical care, research and reporting were debated and supported. Consensus was reached that the KPIs for use in emergency surgery care needed to be simple, with a small number for each major condition.

## Discussion

Globally, there is increasing interest in improving emergency surgery outcomes by health providers, learned societies, colleges and health departments [15–17]. Over a decade ago, it was estimated that more than 230 million surgical procedures were performed and within that workload, emergency general surgery accounts for a significant part [18]. In addition, emergency surgery has one of the greatest overall associated mortalities of any medical discipline [19]. It is estimated that 890,000 patients die during their emergency surgical care annually [20]. Patients undergoing laparotomy have variable mortality depending on their diagnosis, treatment and location of service provision [1, 2, 4, 21]. The American College of Surgeons National Surgical Quality Improvement Program database identified that emergency surgery patients have significantly more postoperative complications (23 vs 14%;  $P < .0001$ ) as well as greater mortality rates (6 vs 1%;  $P < .0001$ ) compared with non-emergency general surgery patients [22]. Ingraham recently reported that an expert panel ranked quality indicators in certain emergency surgery conditions [23]. They reviewed historic compliance with select quality indicators for four procedures (cholecystectomy, appendectomy, colectomy, small bowel resection) at four academic centres and concluded that potential adherence to quality indicators may improve the quality of emergency general surgery care provided for which current outcomes are potentially modifiable [23]. The summit reported KPIs in a much larger group, incorporating 20 conditions and sectors of health care provision.

To improve outcomes, we must not just develop quality benchmarks and standards but also understand prevalence and significance of complications [24, 25]. While there are limitations to many new systems being developed [26, 27]. It is only through engagement with all the disciplines involved in emergency surgery that care will evolve and improve. The Donegal Summit on resources for optimal care included not just surgeons, but also emergency physicians, anaesthetists, critical care, internal medicine, gastroenterology, radiology and nursing. While the summit developed and reported potential key performance indicators and outlines of basic resources required for functioning part of emergency

surgery systems, it had limitations. There was inadequate patient forum representation. The process was consensus-based and did not use a formal statistical or Delphi approach for the development of KPIs. The KPIs would in time need to be validated.

The summit and this proceedings paper have however set a process in place to facilitate concepts and benchmarks in resourcing emergency surgery. It has mirrored that international desire to improve outcomes [24].

Over the last decade there has been increasing development of Acute Care Surgical Units. Some of these have developed and reported limited KPIs [7]. Trauma care has been to the forefront of KPI development in acute care. In other areas of surgery, KPIs are widely reported. This summit was unique in having many key opinion leaders in attendance and discussing the process.

## Conclusion

In conclusion, the Summit on Resources for Optimal Care of Acute Care and Emergency Surgery Consensus Summit successfully identified key aspects of emergency surgery that need to be tackled to outline optimal strategy of care and definitive KPIs. Future work needs to expand on the work achieved here and in other forums, to define optimum care and robust, meaningful measurement tools of process and outcome. The WSES will lead the process in standardised KPI development. The summit acknowledged superb efforts to enhance emergency surgery care by others but felt an international collaboration and commitment was needed to implement and monitor these systems as soon as possible.

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## Availability of data and materials

I would suggest this can be linked to the proceeding document which is a 250-page book.

## Authors' contributions

Each author contributed to writing a chapter on either position statement or key performance indicators. All authors read and approved the final manuscript.

## Ethics approval and consent to participate

Not applicable.

## Consent for publication

Not applicable.

## Competing interests

Michael Sugrue Consultant Smith and Nephew. Jan J. De Waele—consultancy for Cubist, AtoxBio, Pfizer, Smith & Nephew, KCI, Bayer Healthcare and MSD.

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